

## CLAIMS

I/We claim:

- [c1]           1.     Apparatus for driving a lamp, comprising:
- (a)    a DC to AC converter for converting a DC signal to an AC signal;
  - (b)    a self-oscillating circuit between the DC to AC converter and the lamp, the self-oscillating filtering the AC signal delivered to the lamp;
  - (c)    a controller for adjusting the DC to AC converter such that the frequency of the AC signal is based on a resonant frequency of the self-oscillating circuit; and
  - (d)    a full wave sense amplifier that senses the current flowing through said lamp.
- [c2]           2.     The apparatus of claim 1, wherein the self-oscillating circuit includes a step-up transformer having a primary winding that receives the AC signal and having a secondary winding that is coupled to the lamp.
- [c3]           3.     The apparatus of claim 2, wherein the self-oscillating circuit includes a filter for the AC signal.
- [c4]           4.     The apparatus of claim 1, further comprising a zero crossing detector for determining the resonant frequency of the self-oscillating circuit and providing an indication of the resonant frequency to the controller.
- [c5]           5.     The apparatus of claim 1, wherein the lamp is a discharge lamp, including a cold cathode fluorescent, metal halide and sodium vapor.
- [c6]           6.     A method for driving a discharge lamp, comprising:
- (a)    converting a DC signal into an AC signal;

- (b) filtering the AC signal to the discharge lamp;
- (c) oscillating the conversion of said DC signal such that the AC signal has a frequency based on a resonant frequency of a load; and
- (d) sensing the full wave current flowing through said lamp.

[c7] 7. A full wave sense amplifier for sensing a periodic current flowing through a lamp, the full wave sense amplifier comprising:

means for sensing the positive going portion of said periodic current;  
means for sensing the negative going portion of said periodic current; and  
means for combining said negative going portion and said positive going portion into a current flow signal.

[c8] 8. The amplifier of claim 7 wherein said means for sensing the positive going portion comprises:

an operational amplifier having a first input connected to a terminal of said lamp; and  
an output transistor having its gate connected to the output of said operational amplifier, its source connected to a current source, and its drain connected to a second input of said operational amplifier.

[c9] 9. The amplifier of claim 8 wherein said means for sensing the negative going portion comprises:

a second operational amplifier having a second input connected to a terminal of said lamp; and  
a second output transistor having its gate connected to the output of said operational amplifier, its source connected to a current source, and its drain connected to said second input of said operational amplifier.

[c10] 10. The amplifier of claim 7 wherein said means for combining is a current source supplying the current flowing through said output transistor and said second output transistor.

[c11] 11. The amplifier of claim 9 wherein a first input of said operational amplifier is grounded.

[c12] 12. The amplifier of claim 9 wherein said second input to said second operational amplifier is connected to said terminal of said lamp through a resistor.